



Integra Seal™ 1.9

7-Polyurethane Spray Foam
 Closed-Cell Insulation
 Technical Datasheet: 6/12/06

Product Description

Integra Seal 1.9 closed-cell spray polyurethane closed-cell foam insulation is a two component, HFC-245fa blown, low-density system designed for commercial and residential insulation.

Closed-cell polyurethane foam yields a high R-value and minimizes air and moisture infiltration. Integra Seal 1.9 increases structural integrity, thereby extending the life of a structure. This product also contributes to a healthier indoor environment by controlling problems associated with vapor drive, such as inner wall condensation, mold, and mildew development.

Integra Seal expands during application to provide increased performance values by sealing the building envelope.

Unique Properties

IDI Distribution, Inc.'s "A" component is a polymeric isocyanate containing reactive isocyanate groups. The "B" component is a combination of polyols, catalytic agents and non-ozone depleting HFC-245fa blowing agent.

Recommended Uses

- Walls
- Floors
- Unvented Attics
- Foundations
- Ceilings
- Piping
- Unvented Crawl Spaces

Environmental Consideration and Substrate Temperatures

Applicators must recognize and anticipate climatic conditions prior to application to ensure highest quality foam and to maximize yield. Ambient air and substrate temperatures, moisture, and wind velocity are all critical determinants of foam quality. Variations in ambient air and substrate temperature will influence the chemical reaction of the two components, directly affecting the

expansion rate, amount of rise, yield, adhesion and the resultant physical properties of the foam insulation. To obtain optimum results, Integra Seal should be spray-applied to substrates when ambient air and surface temperatures fall within a range of 55°F to 110°F. All substrates to be sprayed must be dry at the time of application. Moisture in the form of rain, fog, frost, dew, or high humidity (>85% R.H.) will react chemically with the mixed components, adversely affecting the polyurethane foam formation, dimensional stability and physical properties of the finished product. Wind velocities in excess of 12 miles per hour may result in excessive loss of exotherm and interfere with the mixing efficiency of the spray gun affecting foam surface texture, cure, physical properties and will cause overspray. Precautions must be taken to prevent damage to adjacent areas from fugitive overspray.

Processing Equipment

Material in containers should be maintained in the 65°F to 90°F range. Heated trailers, hotboxes, or heated tank storage may be necessary. Material temperature should be confirmed with a thermometer or IR gun. Do not configure equipment to recirculate Integra Seal from proportioner back into drum. Do not recirculate or mix other suppliers' "A" or "B" component into Integra Seal containers. 2:1 transfer pumps are recommended for material transfer from container to the proportioner.

The plural component proportioner must be capable of supplying each component within ± 2% of the desired 1:1 mixing ratio by volume. Hose heaters should be set to deliver 125°F to 130 °F materials to the spray gun. These settings will ensure thorough mixing in the spray gun mix chamber in typical applications. Optimum hose pressure and temperature may vary as a function of the type of equipment, ambient and substrate conditions, and the specific application.

Typical Physical Properties

Properties	Test Method	Value	Properties	Test Method	Value
In Place Density:	ASTM D-1622	1.9 lbs./ft. ³	Noise Reduction Coefficient:	ASTM C423	0.2 (NRC)
Compressives:	ASTM D-1621		Sound Transmission Class:	ASTM E90-85/E413	43 (STC)
Parallel to Rise:		15-20 psi	Fungus Test :	ASTM G21	Zero Rating
Perpendicular to Rise:		7-9 psi	Processing Parameters & Physical Characteristics		
Tensile Strength:			Pre-heater Temperature:	"A" 125-130°F, "B" 125-130°F	
Parallel to Rise:	ASTM D-1623	20 psi	Hose Temperature:	125-130°F "A" and "B"	
Shear Strength:	ASTM C-273	15-20 psi	Pressures:	1200-2000 psi (static)	
Adhesion:	ASTM D-1623	Equal to Tensile	Mix Ratio Parts	1 to 1 by volume "A" to "B"	
Water Absorption:	ASTM D-2842	0.94% @ 96 hours	Viscosity @ 77°F:	400-500 cps "B" Component	
Closed Cell Content:	ASTM D-2856	>92%	Core Density:	1.90-2.10	
Dimensional Stability:	ASTM D-2126	(28 Days at 158°F,	*Adhesion should not be tested within one hour of application		
95% RH)			Product Reactivity		
% of Vol. Change		<15% Actual 8.8%	Surface Temperature	55-110°F	
K-Factor (initial):	ASTM C-518	0.14	Cream Time, sec.	2-3	
R-Value (initial):	ASTM C-518	7.14	Tack FreeTime, sec.	7-8	
Permeance:	ASTM-E96	.95 @ 2 inches	Cure Time, hr.	4	
		.88 @ 3 inches			
		.56 @ 4 inches			

Test values may vary depending on type of equipment, equipment settings and environmental conditions.

Processing Equipment (continued)

It is the responsibility of the applicator to properly interpret equipment technical literature, particularly information that relates acceptable combinations of gun chamber size, proportioner output, and material pressures. The relationship between proper chamber size and the capacity of the proportioner's pre-heater is critical. Mechanical purge spray guns (specifically direct impingement or DI type) are recommended over air purge guns for highest foam quality. Contact your local IDI Distribution, Inc. representative for specific recommendations, pricing, and availability of spray and auxiliary equipment.

CAUTION: Extreme care must be taken when removing and reinstalling drum transfer pumps so as NOT to reverse the "A" and "B" components.

Thermal Barrier

IRC and IBC codes require that SPF be separated from the interior of a building by a thermal barrier, which is applied over SPF to slow thermal rise during a fire, and delay its involvement in a fire. A building code definition of an approved thermal barrier is one that is equal in fire resistance to 1/2 inch gypsum board. Thermal barriers limit the temperature rise of the underlying SPF to not more than 121°C (250°F) after 15 minutes of fire exposure in compliance with ASTM-E119 (Test Methods for Fire Tests of Building Construction Materials). Thermal barriers meeting this criterion are termed a "15 minute thermal barrier" or classified as having an "index of 15". IDI Distribution, Inc. recommends that an approved thermal barrier separate Integra Seal from the building interior unless waived by a local building code official. There are exceptions to the thermal barrier requirement: (1) Code authorities may approve coverings based on fire tests specific to the SPF application. For example, covering systems that successfully pass large scale tests may be approved by code authorities in lieu of a thermal barrier; (2) SPF protected by 1" thick masonry does not need a thermal barrier. Certain materials that offer protection from ignition, called "ignition barriers," may not be considered as thermal barrier alternatives unless they comply with ASTM E-119. Just because a material is advertised as a "thermal barrier" or "ignition barrier" does not mean that it has been tested in conjunction with SPF and approved by a code agency or a local code official. Applicators should request test data and code body approvals or other written indications of acceptability under the code to be sure that the product selected offers code-compliant protection.

Vapor Retarder

Integra Seal is a vapor retarder when applied at 2" thickness or greater. Below 2", it is not a vapor retarder and will allow some diffusion of moisture through the insulation, and the following considerations are needed: (1) A vapor retarder needs to be considered in the design of the building envelope in cold climates, such as zones 6 and higher in the U.S., as defined in 2004 Supplement to the IRC, Table N1101.2. (2) A vapor retarder also needs to be considered where high interior humidity conditions exist. (3) When applying Integra Seal in crawl spaces under living space, the underside of a floor system may require the application of vapor retarder primer to prevent moisture diffusion into the flooring system. This is a concern when applying in warm, humid counties as defined in 2004 Supplement to the IRC, Table N1101.2.1. (4) The applicator should consider a vapor retarder in crawl space applications with hardwood floors, which may be damaged by moisture intrusion. Crawl space applications may require a thermal barrier between the foam and wood flooring, depending upon local codes.

Where exposed rim joist applications are approved, vapor retarder criteria must be strictly adhered to for successful application. Refer to local codes and manufacturer's written specifications to ensure compliance.

Exotherm Caution

Spray foam liquid to cellular plastic transition depends upon an exothermic (heat-producing) reaction between the "A" and "B" components. Applicators should limit Integra Seal thickness to 3" to 4" per pass to avoid fire hazards resulting from excessive heat generation. If subsequent passes are needed, applicators should wait 10 minutes between passes to allow reaction heat to dissipate. The exothermic reaction can cause temporary substrate thermal rises in excess of 150°F, which may result in substrate thermal expansion. If the substrate then contracts when the reaction heat dissipates, substrate deformation can occur.

General Safety, Toxicity and Health Data

Material Safety Data Sheets are available on this polyurethane foam material. Any individual who may come in contact with these products should read and understand the MSDS.

Handling and Safety

Respiratory protection is MANDATORY! Contact IDI Distribution, Inc. for a copy of the Model Respiratory Protection Program developed by API or visit their website at www.polyurethane.org. Persons with known respiratory allergies should avoid exposure to the "A" component. The "A" component

Credentials/Certifications

Integra Seal is available in a Class I formulation, as set forth under Underwriters Laboratories (UL 723, ASTM E-84), and possess the flammability characteristics below:

	ASTM Method	Class I	Class II	Class III
Underwriters Laboratories	E-84			
UL 723, Surface Burning Characteristics	Tunnel Test			
Flame Spread		≤25	≤75	Non-rated
Smoke Development		≤450	≤450	Non-rated

contains reactive isocyanate groups while the "B" component contains amine and/or organometallic catalysts with blowing agents. Both materials must be handled and used with adequate ventilation. The vapors must not exceed the TLV (0.02 parts per million) for isocyanates. Avoid breathing vapors. Wear a NIOSH approved respirator. If inhalation of vapors occur, remove victim from contaminated area and administer oxygen if breathing is difficult. Call a physician immediately. Avoid contact with skin, eyes, and clothing. Open containers carefully, allowing any pressure to be relieved slowly and safely. Wear chemical safety goggles and rubber gloves when handling or working with these materials. In case of eye contact, immediately flush with large amounts of water for at least fifteen minutes. Consult a physician immediately. In case of skin contact, wash area with soap and water. Wash clothes before reuse.

Fire Hazard

Fires involving either of these components may be extinguished with carbon dioxide, dry chemical, or inert gas. Application of large quantities of water spray is recommended for spill fires. Personnel fighting the fire must be equipped with NIOSH approved self-contained breathing apparatus.

Cleaning of Spills or Leakage

Cover the area with an inert absorbent material such as clay or vermiculite and transfer to metal waste containers. Saturate with water but do not seal the container with the isocyanates and water mixture. The area should then be flushed with large amounts of water, in the case of the "B" component, or a 5% aqueous ammonia, in the case of the "A" component. Dispose of these materials in compliance with federal, state and local regulations.

Caution: Isocyanates will react with water and generate carbon dioxide. This could result in rupture of closed containers.

Disclaimer

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